Hospital Outcomes Reports using Administrative Data

Presenter:
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Main Points

- Measuring healthcare quality
- Summary of administrative data reports
- Risk-adjustment and quality ratings
- Hospital comment letters
- Adding laboratory values to the discharge data
- Challenges of public reporting

Healthcare Quality

Robert Brook, Elizabeth McGlynn, and Paul Shekelle (2000) **Defining and Measuring Quality of Care: A Perspective from US Researchers**

"In the last 30 years, research has demonstrated that 1) quality can be measured, 2) that quality varies enormously, 3) that where you go for care affects its quality far more than who you are, and 4) that improving quality of care, while possible, is difficult and painful."

Organizational Factors and Clinical Processes Influence Patient Outcomes

Organizational factors

(e.g., nursing ratios, hospital size)

Clinical Processes
(e.g., tests performed, beta-blockers)

Patient Outcomes

(e.g., 30-day mortality, hospital readmission, complications)

Public Reporting of Healthcare Outcomes

- Two pathways for improvement. Public reporting:
  1. Motivates internal quality improvement
  2. Steers patients and payers towards high performing hospitals or surgeons
- Evidence suggests that public reporting of outcomes is effective

Administrative Data Reports

- Heart Attack: 1992-94, 1994-96, 1996-98
- Community-Acquired Pneumonia: 1999-2001, 2002-2004, 2003-2005
- Agency for Healthcare Research and Quality (AHRQ) Inpatient Mortality Indicators: 2006-2007
- AHRQ volume and utilization indicators: 2005-2007

- Studies in preparation
  - Maternal Outcomes
  - Congestive Heart Failure
  - Abdominal Aortic Aneurysm (AAA) Repair
  - Hip Fracture
  - Stroke Outcomes

Risk-Adjustment and Quality Ratings

- Hospital-level **risk-adjusted death rate** (RADR)
  - Apply regression coefficients to patient data to obtain expected number of deaths for each hospital
  - RADR = $\frac{\text{observed death rate}}{\text{expected death rate}}$ * statewide death rate
  - Confidence Intervals – 98%
    - Low volume hospitals generally will have wider confidence intervals
- Quality rating:
  - "Better" = RADR < state rate
  - "Worse" = RADR > state rate

Working with the Hospitals: Comment Letters

Pneumonia report:

- "We believe strongly that the Community-Acquired outcomes report does not reflect the reality of hospital quality care, nor the true risk of death following community-acquired pneumonia because of inaccuracies in data on the source of admission. "

AHRQ Inpatient Mortality Indicators:

- "The data does not appear to be adjusted for multiple co-morbid conditions that could contribute to death of an inpatient and does not account for a patient who has determined they do not want to be resuscitated if their condition deteriorates while in the hospital.

Improving Administrative Data

- Administrative data are created for billing, not predicting mortality
- Administrative data is improved substantially with "Present-on-Admission" (POA) fields
  - Reward hospitals for sicker patients, not for making them sick
  - Important that hospitals code POA accurately
- In 2011, OSHPD will add laboratory values to the patient discharge data
  - In combination with POA fields, hybrid dataset will come closer to the clinical data "gold standard"

Data Elements: Final List

- Lab Values
  - **AST**
  - **Potassium**
  - **Sodium**
  - **pH**
  - **PT/INR**
  - **Albumin**
  - **Creatinine**
  - **BUN**
  - **Platelets**
  - **White Blood Cells**
  - **Hematocrit/Hemoglobin**
- Vital Signs
  - **Oxygen Saturation**
  - Pulse
  - Blood Pressure
  - Respiration Rate
  - Temperature
- Operating Physician ID
- Patient Address

Items in bold have been approved for the final list

Challenges

- Poor quality data can impact hospital ratings (validation is effective, but resource intensive)
- 30-day mortality is a better measure than in-hospital mortality (hospital discharge practices may vary), but there is a delay in obtaining vital statistics data
- Risk-adjustment allows fair comparisons between hospitals, but the process can be time consuming
  - Clinical consultation and literature review
  - Risk-factor data validation
  - Technical Advisory Committee consensus

Challenges, cont.

- How do we present statistical results?
  - Consumers prefer simple reports
  - Providers want to illustrate the uncertainty of the results
- Stakeholders have different perspectives
  - Perfection is the enemy of the good
  - Do not risk our reputation with unreliable or invalid reports

Hospital Ratings for Pneumonia Report

	D = DNR model	12.29% = State Average	
SACRAMENTO COUNTY: KAISER FDN HOSP-SACRAMENTO		17.36	(–)
(N = 1,115)	D	15.16	(–)
KAISER FDN HOSP-SOUTH SACRAMENTO		17.18	(–)
(N = 822)	D	15.23	(–)
MERCY GENERAL HOSPITAL		14.10	
(N = 1,035)	D	12.60	
MERCY HOSPITAL-FOLSOM		17.01	(–)
(N = 358)	D	16.81	(–)
MERCY SAN JUAN HOSPITAL		13.30	
(N = 1,519)	D	11.87	
METHODIST HOSPITAL OF SACRAMENTO		13.51	
(N = 645)	D	12.79	
SUTTER GENERAL HOSPITAL		11.80	
(N = 895)	D	12.00	
SUTTER MEMORIAL HOSPITAL		10.52	
(N = 407)	D	11.53	
UNIV OF CALIFORNIA DAVIS MED CTR		15.20	
	D	14.13	

California Hospital Risk-Adjusted Mortality Rates and Quality Ratings for AHRQ Inpatient Mortality Indicators, 2007

Office of Statewide Health Planning and Development (OSHPD)

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County	Hospital Name	Esophageal Resection % Mortality (# Cases)*	Pancreatic Resection % Mortality (# Cases)	Craniotomy % Mortality (# Cases)	Acute Stroke % Mortality (# Cases)	Gastro-Intestinal Hemorrhage % Mortality (# Cases)	Hip Fracture % Mortality (# Cases)	PTCA** % Mortality (# Cases)	Carotid Endarterectomy % Mortality (# Cases)
STATEWIDE		**6.5 (190)**	**4.6 (623)**	**6.7 (13,132)**	**10.4 (49,915)**	**2.1 (48,691)**	**2.4 (23,700)**	**1.3 (52,152)**	**0.4 (8,132)**
LAKE	REDBUD COMMUNITY HOSPITAL				**39.7 (33) Worse**	4.5 (36)	3.7 (18)		
	SUTTER LAKESIDE HOSPITAL				11.6 (41)	4.5 (68)	1.8 (34)		
LASSEN	BANNER LASSEN MEDICAL CENTER				**35.2 (10) Worse**	0 (20)	0 (6)		
LOS ANGELES	ALHAMBRA HOSPITAL			0 (3)	5.4 (66)	0.6 (103)	0 (35)		
	ANTELOPE VALLEY HOSPITAL			9.4 (29)	8 (336)	2.2 (295)	**5.5 (135) Worse**	1.5 (308)	0 (29)
	BARLOW RESPIRATORY HOSPITAL								
	BELLFLOWER MEDICAL CENTER				0 (16)	0 (27)	0 (8)		
	BEVERLY HOSPITAL			0 (15)	8.8 (189)	2.2 (164)	2.3 (63)	0.5 (106)	0 (24)
	BROTMAN MEDICAL CENTER			3 (70)	8.8 (110)	2.9 (128)	0 (44)	0.7 (92)	2.3 (9)
	CALIFORNIA HOSPITAL MEDICAL CENTER - LOS ANGELES			6.2 (26)	12.1 (243)	2.8 (235)	0 (49)		
	CATALINA ISLAND MEDICAL CENTER								
	CEDARS SINAI MEDICAL CENTER	0 (11)	11.4 (28)	5.9 (524)	11.3 (498)	1 (457)	2 (215)	1.1 (1,009)	0 (113)
	CENTINELA FREEMAN REG MED CTR-MARINA CAMPUS				4.5 (86)	1.3 (103)	1.7 (57)		0 (4)
	CENTINELA HOSPITAL MEDICAL CENTER			**11.4 (73) Worse**	9.3 (518)	1.9 (434)	1 (76)	0.7 (314)	0 (29)

* *% Mortality = Risk-adjusted inpatient mortality rate # Cases = a hospital's total number of patients undergoing this procedure or with this condition*

** *PTCA = Percutaneous Transluminal Coronary Angioplasty*

Note: Agency for Healthcare Research and Quality, Inpatient Quality Indicators, Mortality Indicators, Version 3.2; Patient Discharge Data, OSHPD, 2007

Blank cells indicate that no procedures were performed or conditions treated; If the rating is blank, a hospital's performance is considered 'Not Different' from the state average

Questions?

- Contact Information

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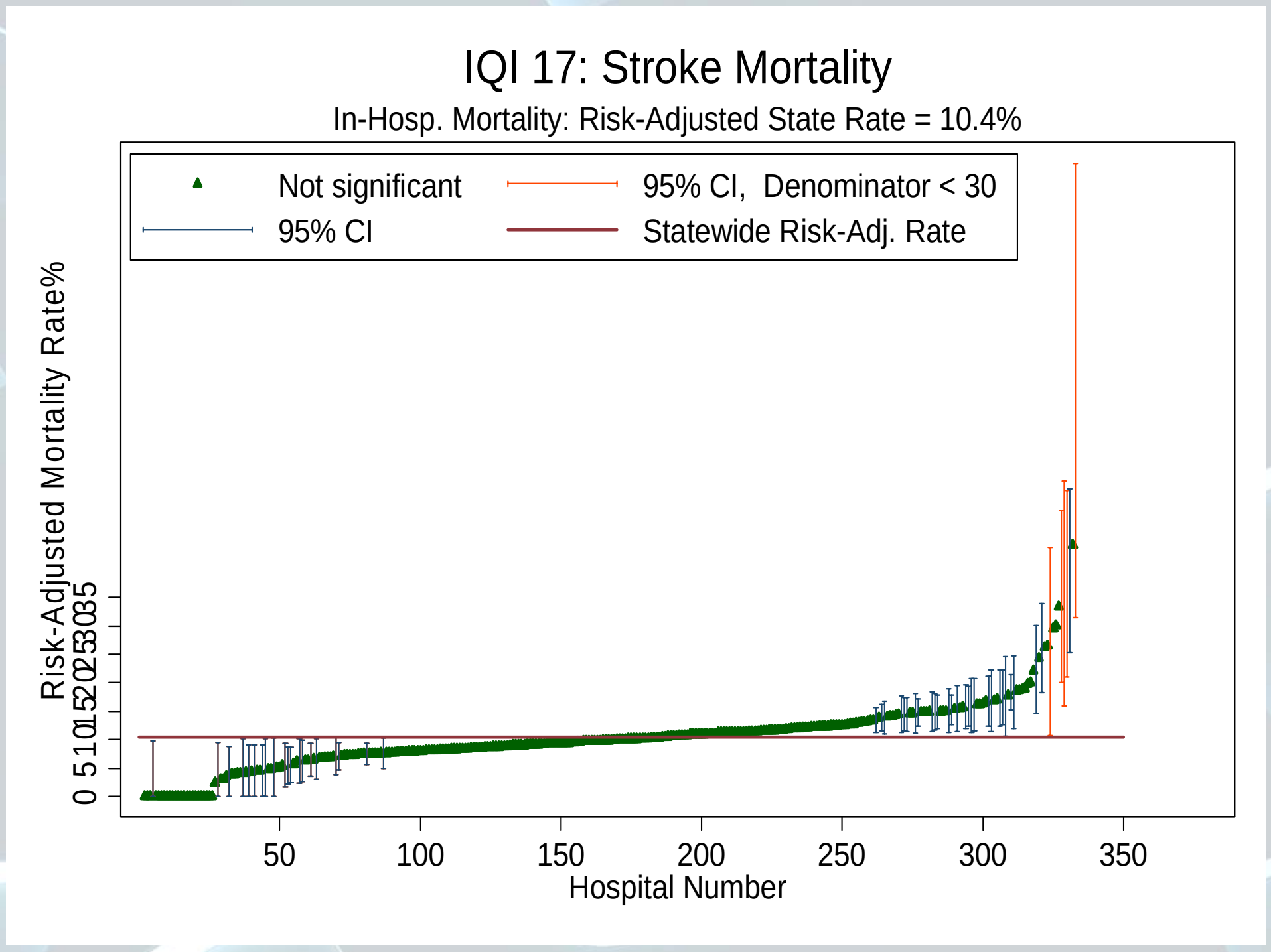
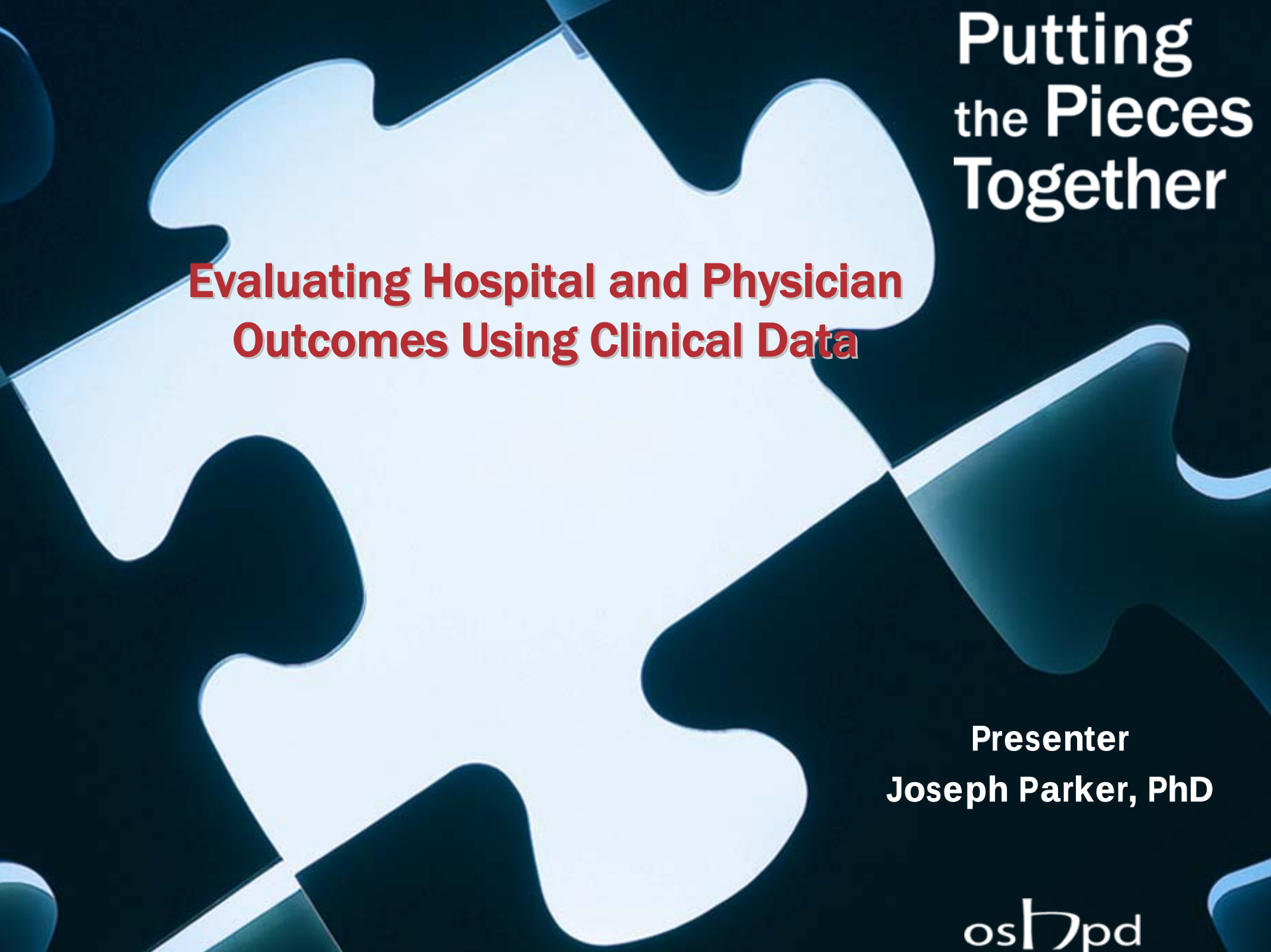

IQI 17: Stroke Mortality
In-Hosp. Mortality: Risk-Adjusted State Rate = 10.4%
Not significant
95% CI
95% CI, Denominator < 30
Statewide Risk-Adj. Rate
Risk-Adjusted Mortality Rate%
0 5 10 15 20 25 30 35
50
100
150
200
250
300
350
Hospital Number



Evaluating Hospital and Physician Outcomes Using Clinical Data

Presenter

Joseph Parker, PhD

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Clinical Data Outcomes Reports

- Why use clinical registry data?
  - Greater acceptance (face validity) by providers
    - It is the language of treatment (not ICD codes)
    - Used in hospital quality improvement activities
    - Collected from clinical unit at hospitals
  - Superior for risk modeling
  - Viewed as essential for physician-level quality reporting
- What topics?
  - Intensive Care Outcomes
  - Coronary Artery Bypass Graft Surgery (CABG)

Clinical Data Outcomes Reports

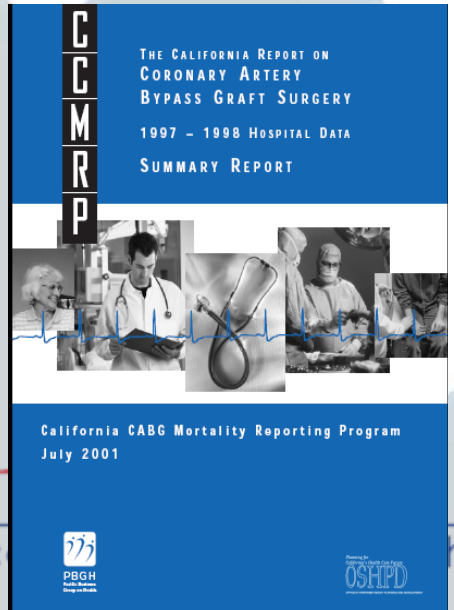
- Intensive Care Unit (ICU) Outcomes
  - Voluntary program began 1999 – OSHPD contract with UCSF (33 hospitals)
  - Studied feasibility of public reporting ICU mortality rates at California hospitals
  - Participating hospitals collected extensive clinical data on a subset of their adult ICU patients
  - Products:
    - Feedback on data quality and processes of care to participants
    - Risk-adjusted mortality rates calculated & shared
    - Two reports with blinded hospital information
  - Hospital ICU outcomes currently reported by California Hospital Assessment and Reporting Taskforce (CHART): Approx. 200 hospitals

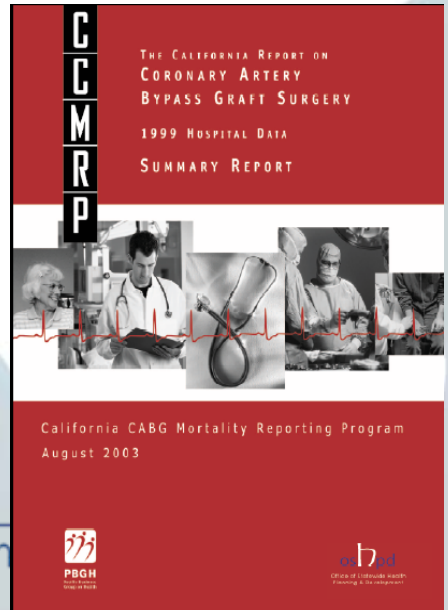
Clinical Data Outcomes Reports

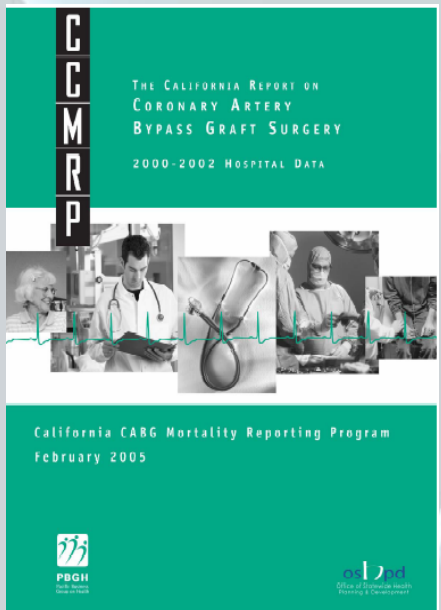
- Coronary Artery Bypass Graft Surgery (CABG) Outcomes ... and more
  - Why CABG?
    - CABG is one of the most expensive hospital surgeries
    - In early 2000s ranked among the top 10 major procedures for volume and rate of mortality
    - History of public reporting (New York, 1989)
  - Key Dates
    - Voluntary program – 1996 (1st public report July, 2001)
    - Legislation - 2001
    - Mandatory program - 2003

California CABG Mortality Reporting Program (CCMRP)

- Voluntary statewide reporting system was established in 1996
- Public/private sector partnership between OSHPD and the Pacific Business Group on Health
- Based on Society of Thoracic Surgeons (STS) database
- Outcome measure: in-hospital mortality for isolated CABG
- Risk-adjustment for differences in patient case mix
- Three reports were produced: 1997-1998, 1999, 2000-2002







CCMRP: Limitations

- Voluntary participation (approx. 70% of hospitals)
  - Lack of data on non-participants
  - Relationship between participation status and outcomes
  - Hospitals allowed to withdraw after seeing preliminary results
- Stakeholder Insistence on statewide reporting
  - Consumer choice
  - Healthcare purchasing (businesses, health plans)
  - Quality improvement by physicians and hospitals

Legislation: Senate Bill 680 (2001)

Created mandatory data reporting program, California CABG Outcomes Reporting Program (CCORP) for all California licensed hospitals that perform heart bypass surgery

- Risk-adjusted results to be reported by hospital (every year) and by surgeon (every two years)
- Hospital and surgeon review process
- Surgeon statement submission (appeals) process
- Created 9-member Clinical Advisory Panel (CAP)
- Periodic hospital data audits

Coronary CABG Outcomes Reporting Program (CCORP)

- First year of data collection 2003
- Data collected on ALL CABG surgeries, but performance reporting only on isolated CABG
- Hospital data certification by CEO/administrator or designee
- Surgeon certification upon data submission
- Hospital penalty for late filings
- Data quality activities

Ensuring Data Quality and Integrity

- Hospital data abstractor training
- Clinical consultation on coding issues
  - Expert cardiologist, Clinical Panel, UC Davis Contract
- CCORP data collection tool provided free
- Automated data edits, quality comparison reports, and requests for supporting documentation
- Linkages to Patient Discharge Data and Death File
- Yearly hospital medical chart audits
- Surgeon “appeals” process

Hospital Medical Chart Audits

- Audit Sample
  - Preliminary hospital and surgeon outliers
  - Near hospital and surgeon outliers
  - Hospitals with probable over-reporting or under-reporting of risk factors
  - Hospitals from a random pool
  - Number of records proportional to hospital size
  - All deaths and highest-risk patients
- Blinded on-site audits
- Detailed audit results provided to hospitals to improve coding
- Audit data replaces submitted data

Subset of CCORP audit results

Agreement Statistics Comparison of CCORP Audit Data from 2003 - 2006									
Audited Data Element	N	Kappa/Pearson Correlation				Percent Coded Correctly			
		2003	2004	2005	2006	2003	2004	2005	2006
Arrhythmia	952	0.517	0.541	0.568	0.603	85.95	89.14	90.65	91.50
Arrhythmia Type	952	0.507	0.517	0.558	0.586	84.91	88.11	90.10	91.00
Cardiogenic Shock	952	0.458	0.623	0.622	0.621	95.07	95.79	96.35	98.10
Cerebrovascular Accident (CVA)	953	0.642	0.747	0.755	0.771	93.08	95.11	94.22	96.00
Cerebrovascular Accident Timing	952	0.627	0.723	0.757	0.761	92.66	94.61	93.98	95.80
Congestive Heart Failure (CHF)	954	0.554	0.551	0.595	0.563	83.23	82.11	84.47	85.90
Dialysis	953	0.886	0.931	0.924	0.942	98.64	99.21	99.37	99.50
Ejection Fraction (%)	927	0.880	0.870	0.881	0.884	51.57	49.43	52.22	51.00
Hepatic Failure	953	0.398	0.174	-0.003	0.132	99.27	98.29	99.21	99.50

Preliminary Results

- Hospitals (60 day review)
  - Preliminary risk-adjusted mortality rates for all hospitals
  - Performance ratings – worse-, better-, or not different-than state average
  - Instructions on how to submit a comment letter for final report
- Surgeons (30 days to appeal)
  - Preliminary risk-adjusted results for that surgeon
  - Performance rating – worse-, better-, or not different-than state average
  - Instructions on how to appeal if “results do not accurately reflect the quality of care provided”

Surgeon "Appeal" Process

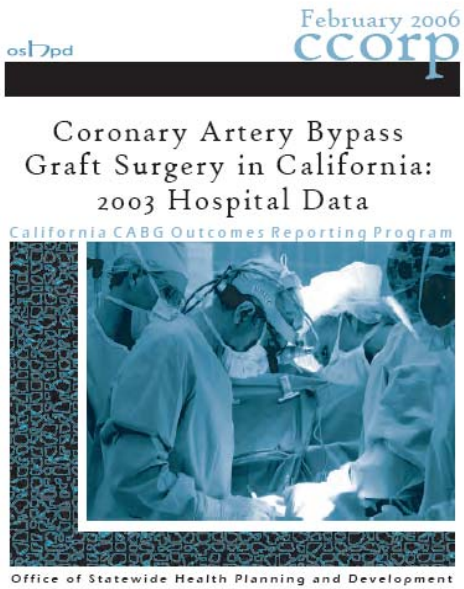
- Surgeons submit statements
- OSHPD reviews statements and agrees or disagrees with surgeon request
- Surgeons not satisfied with OSHPD decision may forward statement to Clinical Advisory Panel for review
- Panel will:
  - Uphold the CCORP decision OR
  - Reach one of the other conclusions set forth by the law
    - Flaw in the risk model so report is flawed
    - Flaw in surgeon data so corrections required
- Panel's determination is final

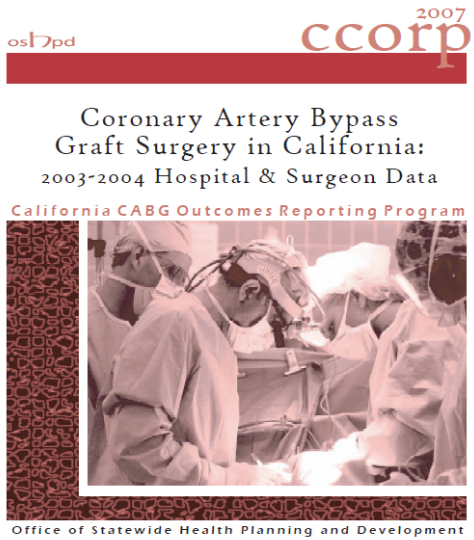
Surgeon Statement Process

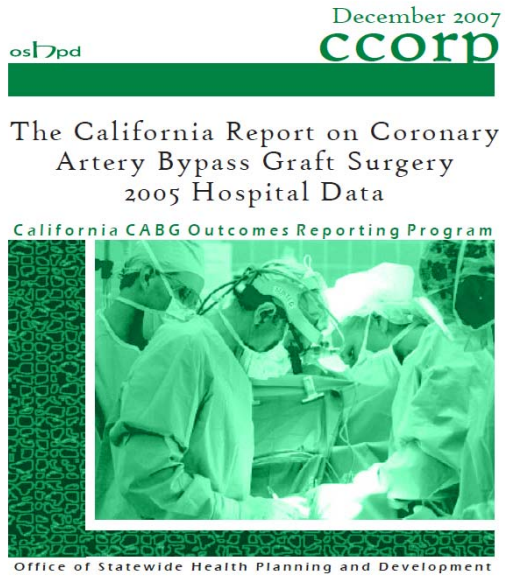
- 2003-2004 Report
  - 31 Statements - 15 forwarded to Panel
  - Panel did not agree with OSHPD on 8 cases, allowed resubmission of data for 6
  - 3 surgeons' performance ratings changed as a result of review process
- 2005-2006 Report
  - 11 Statements – 5 forwarded to Panel
  - Panel concurred with OSHPD on all but one statement
- Issues
  - Assignment of responsibility
  - Very high-risk patients (risk model inadequate)
  - Non-isolated vs. isolated CABG procedure

CCORP Reports

- Three prior reports: 2003, 2003-2004, 2005







Report Contents

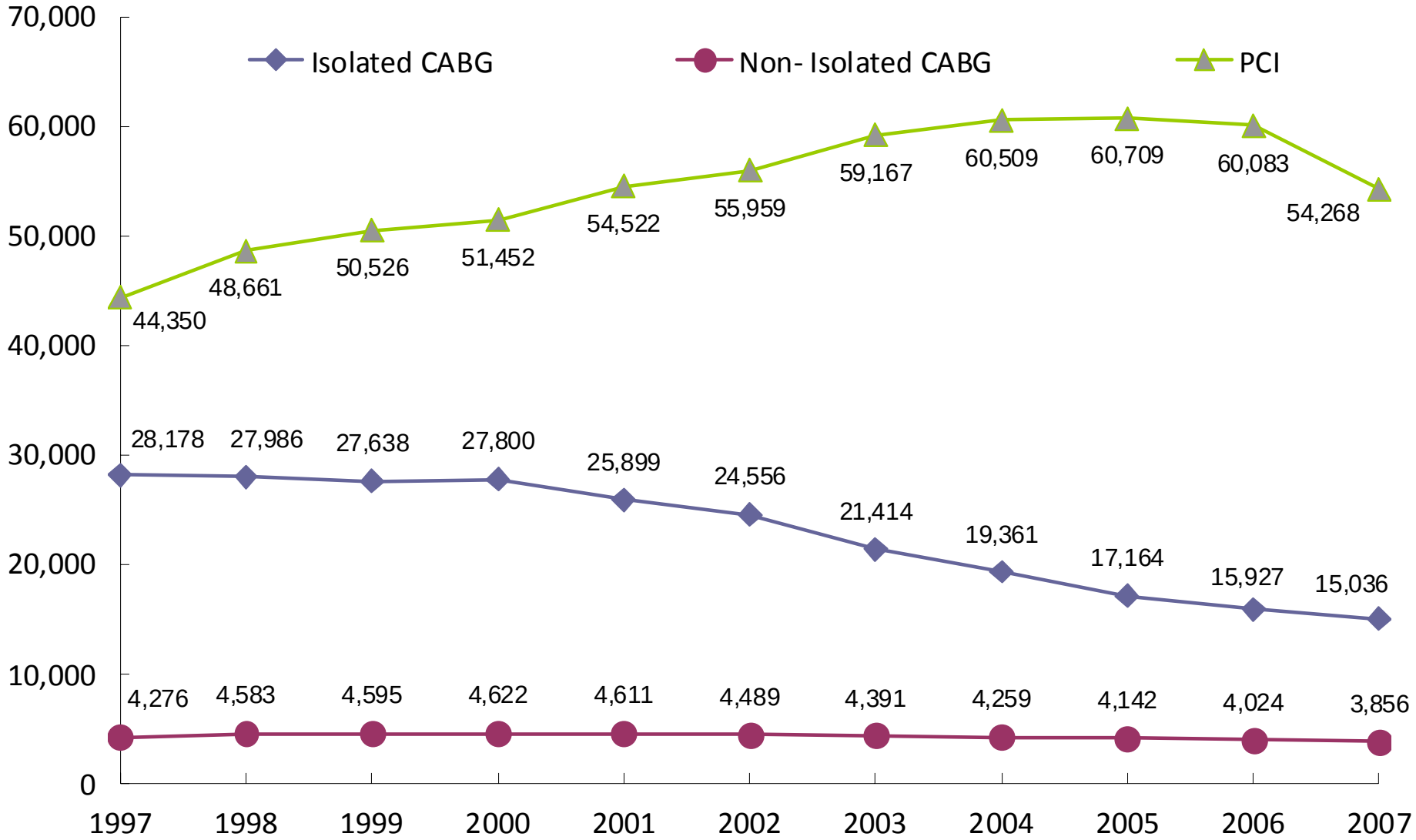
- Risk Model
- Risk-adjusted operative* mortality rates and performance ratings for hospitals and surgeons on isolated CABG surgeries
- Performance ratings – hospitals and surgeons rated as **worse** than, **better** than, or **same** as state average
- Hospital performance ratings for use of the Internal Mammary Artery (the preferred artery for bypass)
  - Only **low** (poor) users given performance rating
- Hospital/Surgeon volume and outcomes associations
- Hospital comment letters

*** Operative mortality: death occurring in the hospital after surgery, regardless of length of stay, or death occurring anywhere after discharge, but within 30 days of CABG surgery**

Impact of CABG Report

- Hospitals have instituted internal quality improvements
- Reported changes in hospital contracting/referrals
- Surgeons involved in the data quality review
- In-hospital and operative mortality rates have declined (36% decline in in-hospital mortality since start of mandatory program)
- UC Davis preliminary report on "Impact of Mandatory Public Reporting"
  - Marked and sustained drop in observed and risk-adjusted operative mortality
  - Lower volume across hospitals and surgeons
  - No detectable avoidance of high-risk patients

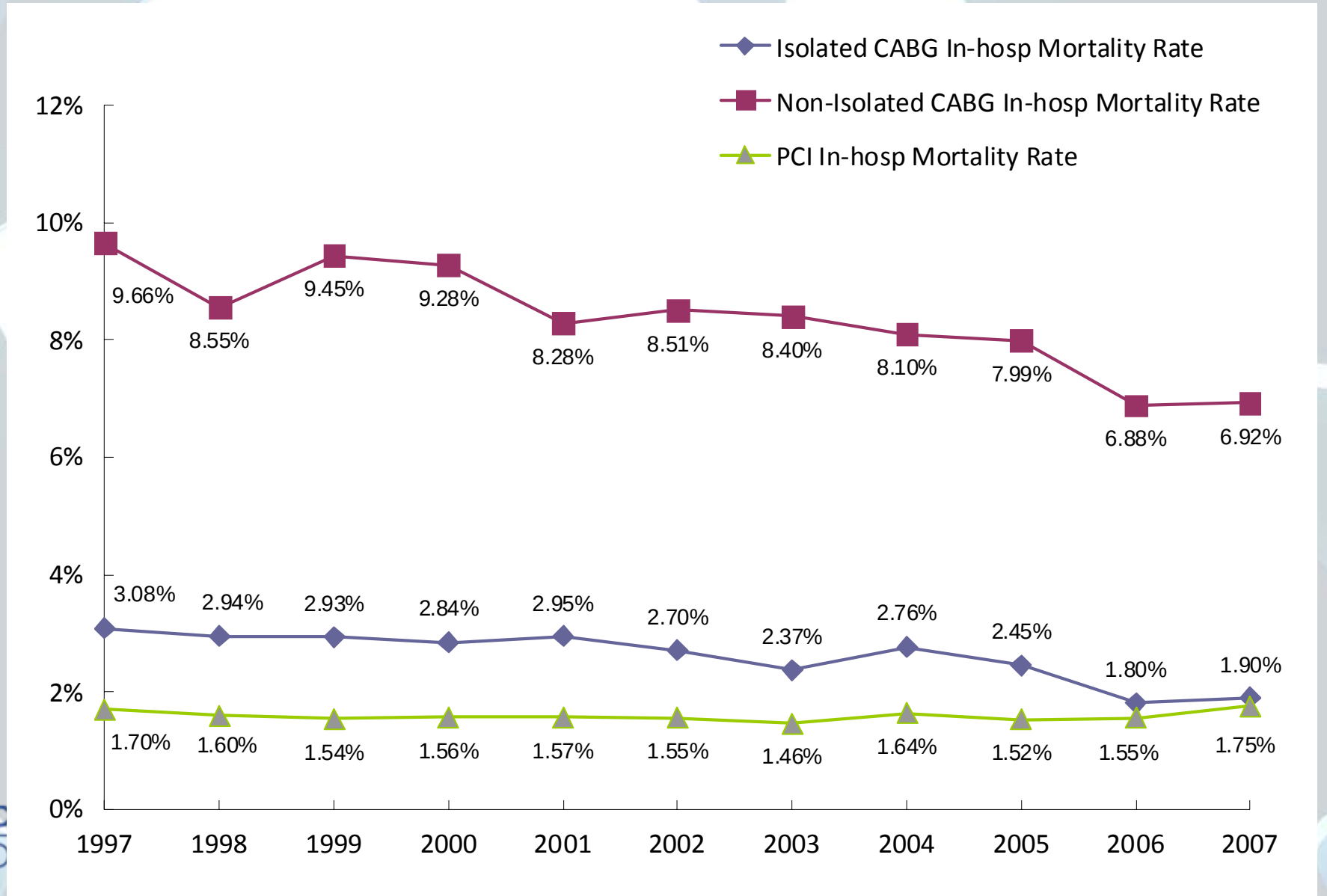
Volume of Isolated CABG, Non-Isolated CABG, and PCI Surgery in California 1997-2007



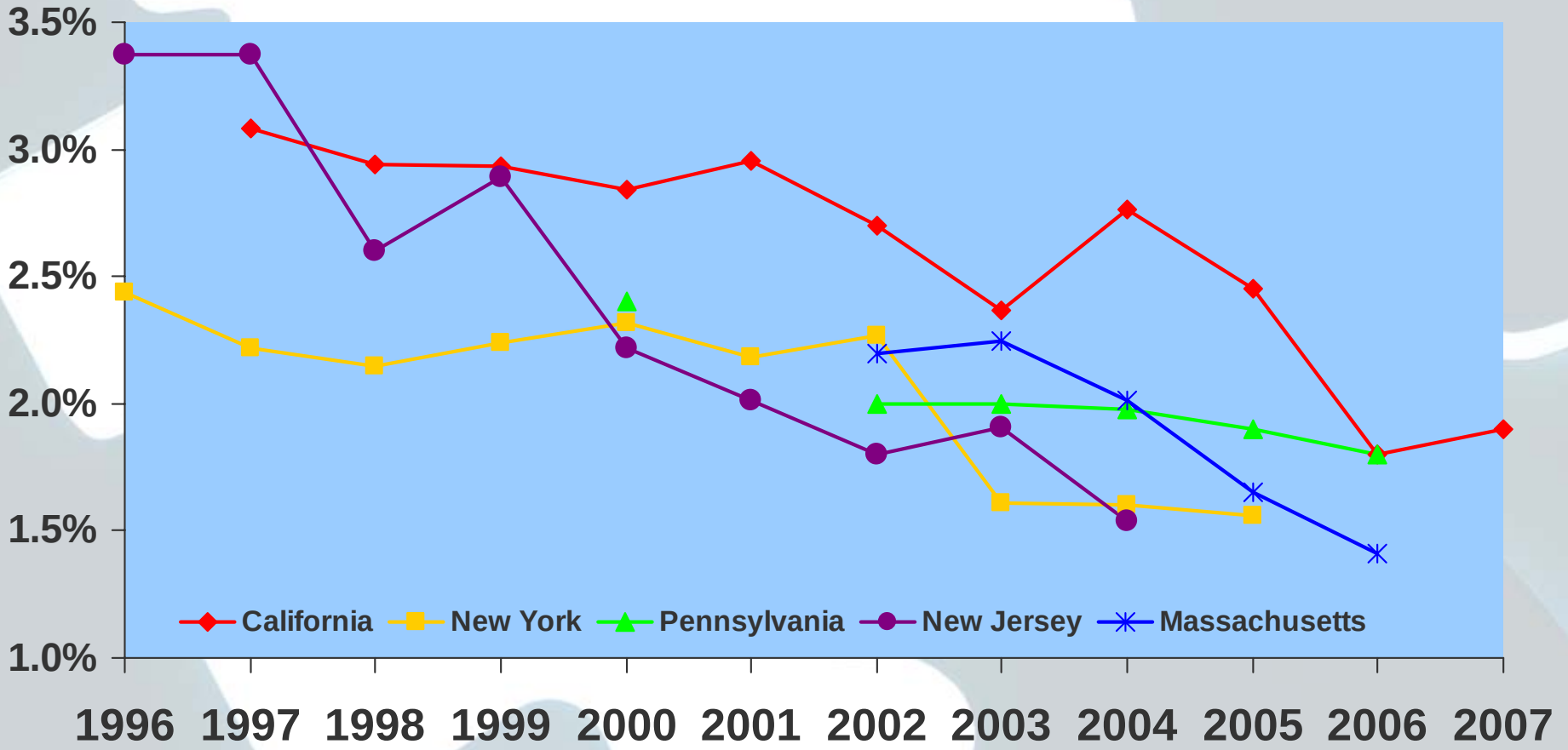
Hospital Volume and Related Statistics Over Time

	2003	2004	2005	2006	2007
Total # CABG performing hospitals	121	120	120	121	121
Mean isolated CABG volume	176	159	141	129	122
Mean non-isolated CABG volume	37	38	37	36	35
# hospitals < 100 cases	31	32	36	44	51
# hospitals < 30 cases	3	5	6	9	8
Lowest volume hospital	25	5	7	2	1

In-Hospital Mortality Rates for Isolated, Non-Isolated CABG, and PCI Surgery in California 1997-2007



Unadjusted Isolated CABG Inpatient Mortality Rates for California and Other States (1996-2007)



Note: rates may be defined slightly differently from state to state

What's New

- 2005-2006 Hospital and Surgeon Report release this week
- Reporting on new outcomes and patient groups
  - Hospital post-operative stroke rates (in 2007 report)
  - Non-isolated CABG mortality (future release)
- Online data reporting for hospitals
- 2003-2005 CCORP researcher file available to qualified researchers
  - Stand-alone patient-level CCORP data file
  - Merged CCORP-Patient Discharge Data file

Questions

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